

CLAIMS

What is claimed is:

1. A system for processing exceptions comprising:
 - a) an exception analysis unit for identifying the causes of exceptional behaviors;
 - 5 b) an exception prediction unit for predicting the occurrence of exceptions; and
 - c) an exception prevention unit for one of preventing exceptions and reducing the impact of an exception.
2. The system of claim 1 further comprising:
 - 10 c) an exception prevention unit for one of preventing exceptions and reducing the impact of an exception.
3. The system of claim 1 wherein the exception includes one of a positive behavior and a negative behavior.
4. The system of claim 1 wherein the exception includes deviations from a predetermined standard of execution.
5. The system of claim 1 wherein the exception prediction unit predicts the
20 occurrence of exceptions as early as possible during the process execution.
6. The system of claim 1 further comprising:
 - an exception monitor for building a warning table; and
 - an exception prevention manager for monitoring the warning table and based
25 thereon for performing at least one of preventing the exception and reducing the impact of the exception.

7. The system of claim 6 wherein the exception prevention manager performs one of raising process instance priority to a predetermined priority level for instances that are likely to be late, modifying process instance and work node priorities, modifying resource assignment policies, and influencing decision points.

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8. The system of claim 6 wherein the warning table includes a process instance identifier, an exception identifier, an execution stage, and probability of an exception occurrence.

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9. A method for analyzing exceptions in a workflow instance comprising the steps of:

a) preparing data from past workflow executions;

b) generating at least one exception analysis model based on the prepared data;

and

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c) using the exception analysis model to provide information on the causes of the exception.

10. The method of claim 9 wherein the step of generating at least one exception analysis model based on the prepared data includes the steps of

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building a process analysis table for a process definition of interest;
adding labeling information to the process analysis table; and
generating classification rules by employing data mining techniques.

11. The method of claim 10 further comprising the steps of:

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displaying the classification rules to a user;
selectively removing input data to refine classification rules; and
re-generating classification rules by employing data mining techniques.

12. The method of claim 11 further comprising the steps of:
when the classification rules are satisfactory to the user, storing the classification rules in a database.

5 13. The method of claim 10 wherein the step of building a process analysis table for a process definition of interest is one of executed once per process independently of which behavior is being analyzed and tailored to a specific behavior.

10 14. The method of claim 10 wherein classification rules are shown and stored as decision trees.

15 15. A method for predicting exceptions in a workflow instance comprising the steps of:

- a) preparing data from past workflow executions;
 - 15 b) generating at least one exception prediction model based on the prepared data;
- and
- c) using the exception prediction model to generate at least one prediction of an exception for a current instance of the workflow.

20 16. The method of claim 15 wherein exception prediction includes the steps of

building a process analysis table for a process definition of interest;
adding labeling information to the process analysis table; and
generating classification rules by employing data mining techniques.

25 17. The method of claim 15 wherein the classification rules generated for each stage in a process are stored in a repository.

18. The method of claim 17 wherein at least one classification rule set generated for a process execution stage is executed to make predictions on at least one running process instance.

5 19. The method of claim 18 wherein at least one prediction is stored in a repository; wherein the prediction stored in a repository includes the exception being predicted and an indication of the accuracy of the prediction.

10 20. The method of claim 15 wherein the predictions are reported to the WfMS so that it can alter the execution of processes to try to avoid the exception;

15 21. The method of claim 15 further comprising:
reporting classification rules to a user.
selectively removing input data to refine classification rules; and
re-generating classification rules by employing data mining techniques.

22. The method of claim 15 wherein when the classification rules are satisfactory to the user, storing the classification rules in a database.